F·A·A·M facility for airborne atmospheric measurements

FLIGHT FOLDER

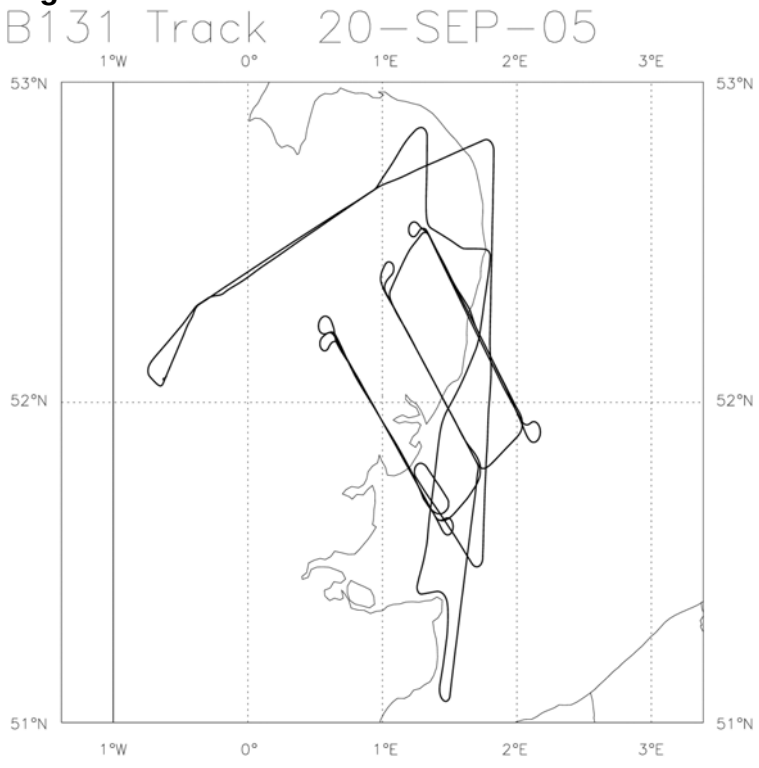
Flight No.:	B131
Date:	20 Sep 2005
Take Off	10:27:23
Landing:	15:18:35
Flight Time	4h51m12

Campaign: CLOPAP

Operating Area: Thames Estuary

POB	Position	Name	Institute
1	Captain	Alan Foster	Directflight
2	Co-pilot	Ian Ramsay-Rae	Directflight
3	CCM	Gaynor Ottaway	Directflight
4	Mission Scientist	Keith Bower	Manchester University
5	Flight Manager	Jim Crawford	FAAM
6	Core Chemistry	Doug Anderson	FAAM
7	Cloud Physics	Jamie Trembath	FAAM
8	CCN/CVI/CCM2	Stuart Heath	FAAM
9	Filters	Alison Perry	FAAM
10	Noxy	Andy MacDonald	UEA
11	WAS	Debbie O'Sullivan	UEA
12	AMS	James Allen	Manchester University
13			
14			
15			
16			
17			
18			
19			
20			

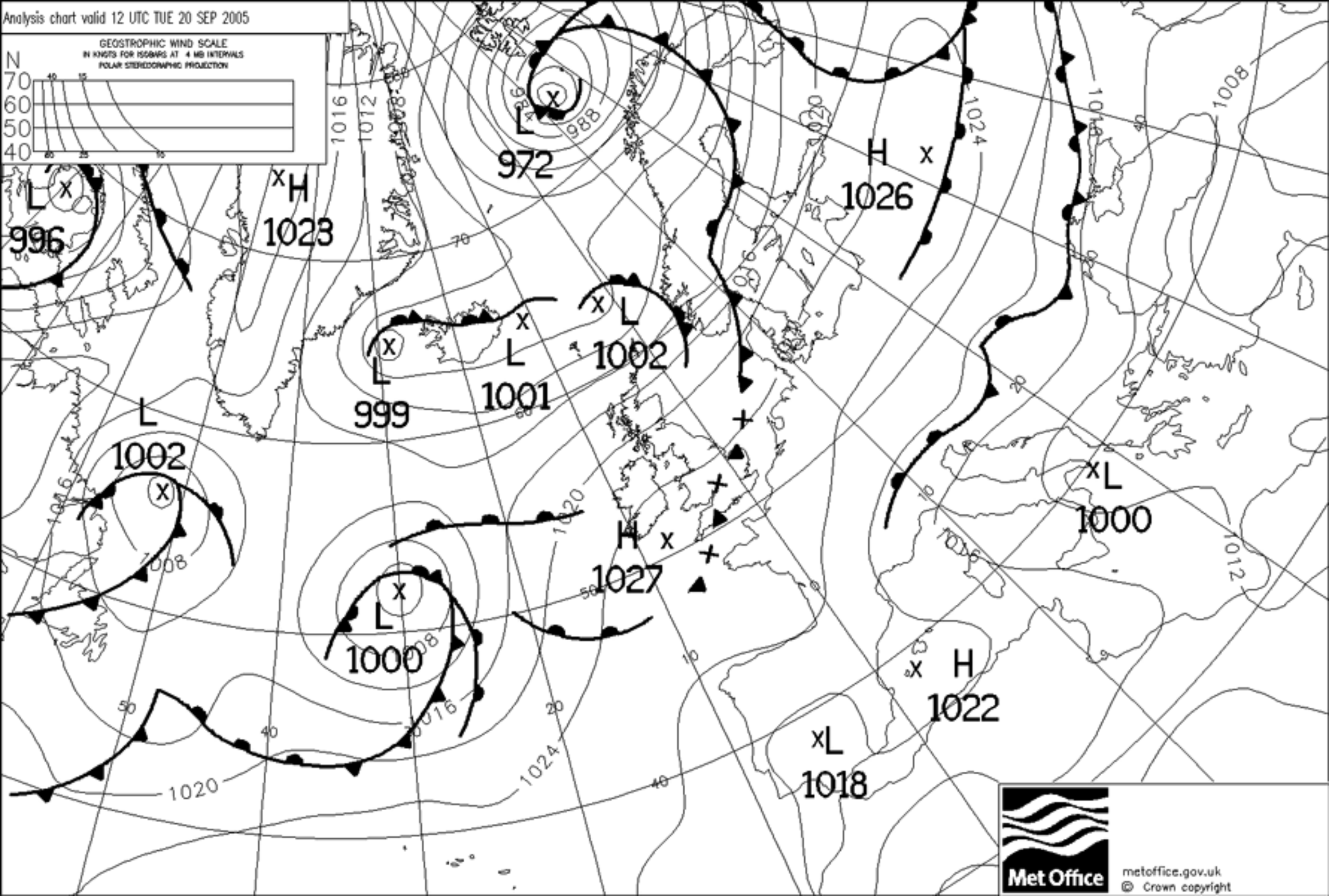
Flight Track:



FLIGHT SUMMARY

Flight No b131
Date: 20 September 2005
Project: CLOPAP
Location: Thames Estuary

Start Time	End Time	Event	Height (s)	Hdg	Comments
100037		inu	0.03 kft	126	to navigate
100057		drs	0.03 kft	126	check - ok
102723		T/O	3.7 kft	027	Cranfield
103914		fl100	10.0 kft	064	calibration transit
105019		video	10.0 kft	072	ffc & rfc tape #1 started
105527		descending	9.3 kft	184	fl100 to above cloud top
105630	110432	Profile 1	7.9 - -.06 kft	182	
110042		nev zero	3.5 kft	183	
110556	111500	Run 1	0.19 - 0.18 kft	187	
111736	112235	Run 2	0.15 - 0.22 kft	316	
111857		bbr	0.19 kft	314	shutter open
112844	113532	Run 3	1.1 - 1.2 kft	315	
113708	114017	Run 4	0.72 - 0.75 kft	318	
114328	115543	Run 5	1.2 - 1.3 kft	153	1500ft
114443		bravo	1.3 kft	144	
115430		video	1.6 kft	104	ffc & rfc tape #2
115847	121117	Run 6	2.7 kft	321	3000ft
121554	122624	Run 7	1.7 kft	146	2000ft
123138	124259	Run 8	2.1 kft	329	2400ft
124644	125826	Run 9	1.2 kft	154	1500ft
130010		video	1.2 kft	052	ffc & rfc tape #3 started
130320	131537	Run 10	1.2 kft	330	1500ft
131945	133052	Run 11	2.5 kft	145	2800ft
133435	134636	Run 12	5.0 kft	331	fl50
135202	140204	Run 13	1.5 kft	148	1800ft
140304	141510	Run 14	0.70 - 0.72 kft	190	1000ft
140523		video	0.72 kft	192	ffc & rfc tapes #4 started
141600		FM PC	0.73 kft	002	froze and reset
141701	142336	Run 15	0.73 - 0.72 kft	359	1000f
142436	144259	Run 16	0.74 - 0.73 kft	017	
143515		manouvre	0.72 kft	036	change of heading 143403
144740		cals	10.0 kft	292	fl100
151835		Land	0.06 kft	309	Cranfield
152930		gps	0.06 kft	309	52'04.36N 0'37.50W
153039		inu	0.06 kft	309	52 04.26N 0 36.08W


Analysis chart valid 12 UTC TUE 20 SEP 2005
GEOSTROPHIC WIND SCALE
IN KNOTS FOR ISOBARS AT 4 MB INTERVALS
POLAR STEREOGRAPHIC PROJECTION
N
70
60
50
40
L
996
H
1023
L
972
H
1026
L
999
L
1001
L
1002
L
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1027
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1000
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1018
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1024
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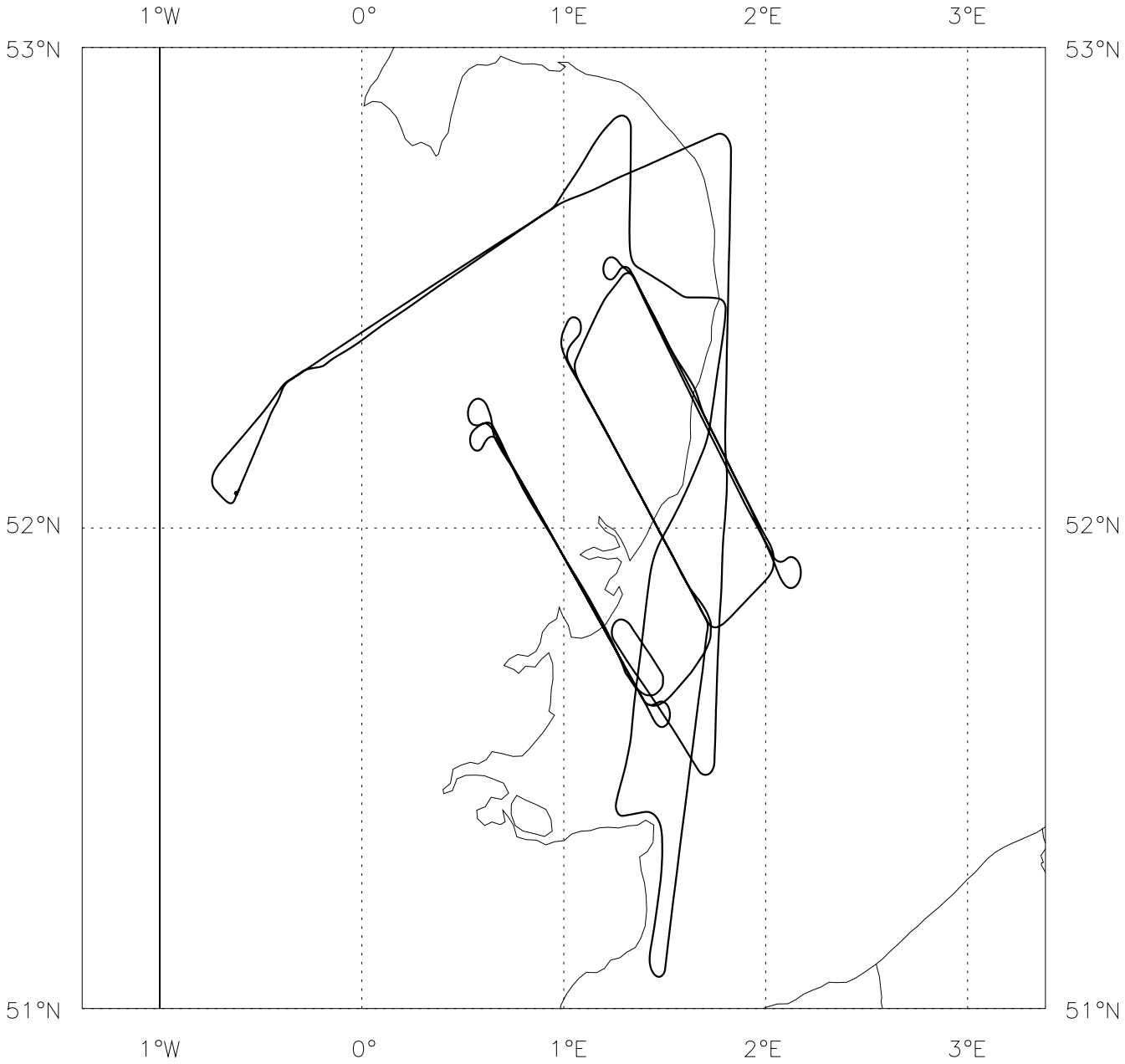
B131 Track 20-SEP-05



Sortie Brief: CLOPAP 8 (prepared by K.N. Bower)

Flight Number : B131
Date: Tuesday 20th September 2005 **Mission Scientist: Keith Bower**

CLOPAP Sortie Aims:

To study the evolution of aerosol in an urban plume as it advects away from the source. To investigate the interaction of the aerosol and gases with cloud both as the aerosol/gas modifies the cloud microphysics and the cloud modifies the aerosol and gases.

CLOPAP Sortie Location:

The plan is to fly in an area of low cloud and sample pollution from a major urban area as it advects towards and interacts with the cloud layer. For this flight the option today is to sample the London plume E or NE of London in a W or SW in the Thames Estuary or off East Anglia (or in the Kent/English Channel area if the wind has a more northerly component). Low cloud is forecasted in this region and in the English Channel although winds are not forecasted to be very strong. In cloudy conditions, several sets of cross-wind runs of 12 minutes duration (or of half this duration on reciprocal headings) will be attempted at various altitudes in the time available. This may be adjusted by the mission scientist omitting parts of these sets of runs to best achieve the science goals in the conditions encountered. Current plans and flight level restrictions allow for three (0r four) sets of runs to be carried out consisting of up to four (or three) runs per set. Profiles will be carried out where possible in each set of runs

CLOPAP Sortie Summary:

The case studies will be carried out by flying a series of up to 84 km# transects across the plume within the boundary layer (one below cloud, and at least one in cloud) and one in the lower free troposphere immediately above cloud top. Each of these sets of transects will be immediately preceded by a vertical profile (where possible) extending into the lower free troposphere starting from as close to the surface as possible. These profiles will establish the vertical mixing and structure of the sampled air and establish the optimum altitudes for the following transects. This flight pattern will be repeated at intervals of about 25km# separation, to obtain up to 4 sets# of transects. Although we are not aiming to perform a comprehensive Lagrangian study, this flight plan will allow us to approximately track the same air as it is advected downwind of the source region. Runs at each altitude may be cut down to a minimum total length of 12 minutes (or 84km) duration or omitted, or certain profiles sacrificed in order to achieve the required study of plume evolution and interaction with cloud. In the absence of cloud, fewer boundary layer transects will be performed, ie the “in-cloud” leg (and some profiles) will be omitted, and the spacing between sets of legs reduced so as to carry out more sets of runs (and hence improve detection of clear-air plume evolution) in the operational area.

CLOPAP Sortie Detail: PTO

Sortie Brief: CLOPAP 8 (draft 1 : prepared by K.N. Bower/M.W.Gallagher)

Flight Number : B131
Date: Tuesday 20th September 2005 **Mission Scientist: Keith Bower**

CLOPAP Sortie Detail:

1. Take off and climb to FL 100 for transit at cruise speed to operating area (with appropriate time [~20mins] spent carrying out NOxy calibration at that level)
2. When downwind of chosen urban source, descend to minimum safe altitude below cloud. Perform a profile ascent by climbing at 1000 ft per minute to pass through cloud and to an altitude 200 ft above cloud top/ boundary layer top.
3. Descend to below cloud base, proceed across wind in the boundary layer until outside the plume as detected by CN counter/gases. Mission scientist to announce out of cloud transect. Perform a straight and level run (SLR) below cloud base (200 ft below cloud base) across wind and of total length 84 km#. CCN measurements should commence at the start of this run. Core Chemistry calibrations should be carried out at start of run (as required) and completion announced so that WAS sampling can begin.
4. Ascend to the middle of the cloud layer. Turn through 180 degrees. Mission Scientist to announce in cloud transect (AMS to switch to CVI inlet) and perform SLR of length 84 km#.
5. Ascend to 200 feet above cloud top turn through 180 degrees - mission scientist to announce out of cloud transect (AMS to return to Rosemount inlet). Perform a SLR of length 84 km#. CCN measurements should also commence at the start of this run. In the event that we cannot operate above cloud top a second in-cloud run will be carried out at a higher altitude than in 4.
6. Ascend to cruising altitude to transit to 25# km downwind and repeat steps 2 to 6
7. Continue repetitions until available flight time in science area is exhausted
8. Climb to transit level to return to home base (with appropriate time [~20mins] spent at FL100 for NOxy calibration)

<u>NB. In the absence of cloud:</u>

9. In the absence of cloud steps 3 and 4 will be replaced by a single in boundary layer cross-wind transect, and the transit distance between sets of runs in item 6 will be reduced to 25km to enable more sets of cross wind runs to be carried out.

Sortie Brief: CLOPAP 8 (Interaction of pollutant aerosol with warm cloud) : TWC/KNB

CLOPAP Scientific Aims

1. To investigate the evolution of an urban plume as it is advected away from the source in cloudy conditions (if low cloud in this area)[#]. Changes in chemical speciation and the partitioning of species between the gas and particulate phases will be investigated.
2. To measure the changes in the size distribution and Cloud Condensation Nucleus (CCN) activity spectrum of the aerosol.
3. To measure changes in cloud microphysics as the aerosol properties in the plume, particularly those of the sub-set of aerosol acting as CCN.
4. To investigate the differences in the composition of aerosol that form cloud droplets and those that remain unactivated and interstitial to the cloud, and to observe how this changes as the plume ages.
5. To investigate the role of vertical exchange between the boundary layer and the free troposphere to understand its effect on the transport of aerosols and trace gases on the cloudy plume.

CLOPAP Weather Conditions

Ideally, a stratocumulus capped boundary layer forming over the sea downwind of a main source of urban air pollution. Limited convective penetration of the boundary layer top is acceptable (but not deep convection). The cloud cover should exceed 70% in the study areas.

CLOPAP Key Measurements requiring operator intervention during flight

Cloud Physics

- **FFSSP, 2DC, 2DP, PCASP**, Normal monitoring to ensure correct operation. Operator should note particular features of interest eg. high/low concentrations,
- **ADA and CPI** – as above
- **CCN** - alleviator should be filled whilst in clear air either below, or upwind of the cloud layer(s) of interest. 1 sample and spectrum per run, if possible.
- **J-W LWC and Nevzorov LWC/TWC**. Where run is only partially in cloud and starts in clear, these should be zeroed/calibrated and logged by Flight Manager.
- **TWC** – initial profile should avoid cloud, if possible, to achieve good calibration.

Chemistry Measurements

WAS - 2 bottle samples per 84km flight leg unless otherwise notified by the Mission Scientist (first sample to be collected after core chemistry calibrations are completed).
NOxy, Ozone, SO2, CO, PTRMS, Hydrogen peroxide to operate continuously.
AMS - to be operated on **Rosemount inlet** out of cloud, **CVI** inlet in cloud. The inlet should be kept closed to avoid contamination whilst the GPU is operating prior to takeoff. It may be opened once the GPU has been removed or after take-off. Similarly, intake should be closed before GPU is started post-flight or before landing.
Filters – these should be exposed on boundary layer out of cloud runs.

Video – the default recording setup should be forward and rearward facing.

CCN measurements :alleviator should be filled at the start of cloud free passes.

Bottle filling and **filter sampling** should occur in clear air transects only. Two[#] bottle samples should be filled during each boundary layer transect and 1 during the free troposphere transect. The Mission scientist will indicate when in plume using CN and selected gas measurements. All other instruments should run continuously.

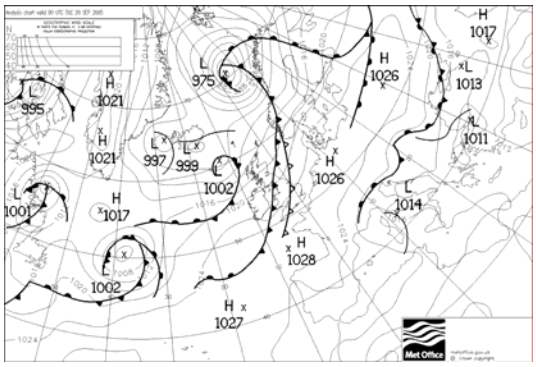
Sortie de-brief: **CLOPAP 8**

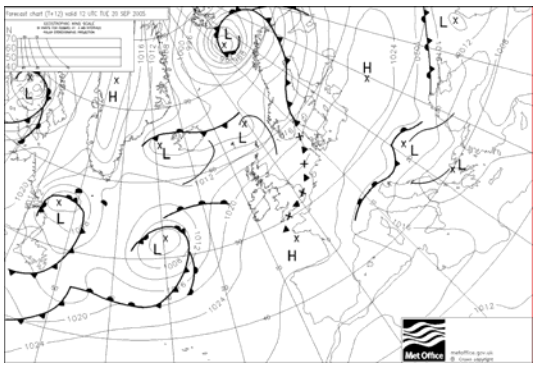
Flight Number: B131
Date: 20th September 05
M.Sci: Keith Bower

Sortie Aims: To study the evolution of aerosol in an urban plume as it advects away from the source. To investigate the interaction of the aerosol and gases with cloud both as the aerosol/gas modifies the cloud microphysics and the cloud modifies the aerosol and gases.

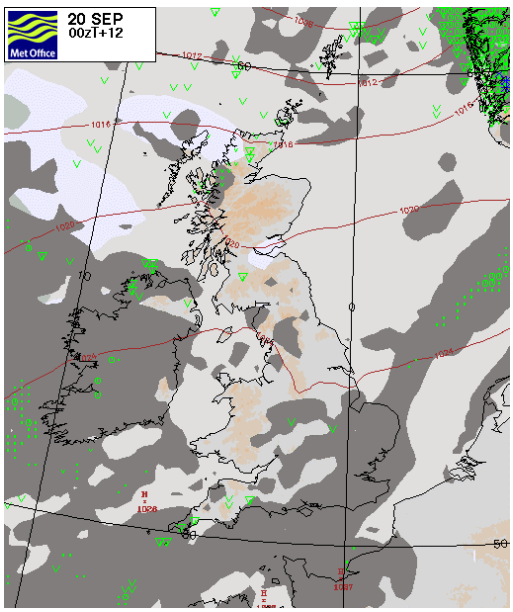
Sortie Location:
In the London plume in an area of low cloud to the E and NE of London in the Thames estuary and over Norfolk.

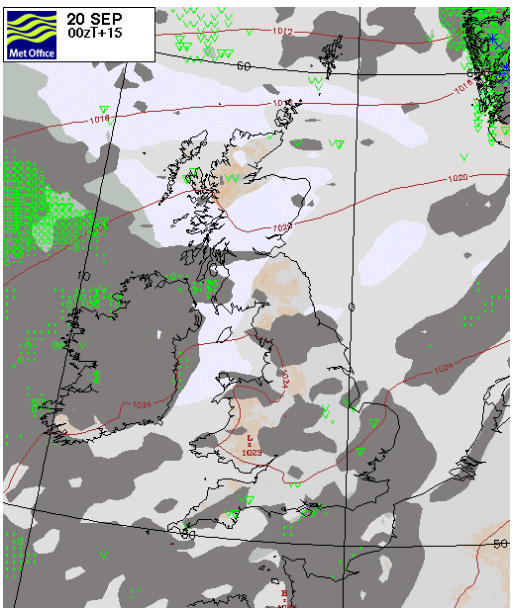
<u>Weather conditions:</u>





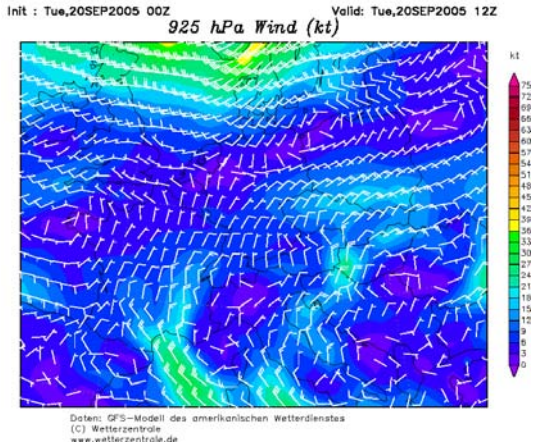
A low pressure system situated to the north of the British Isles over night moved eastwards towards Scandinavia during the day causing a series of weak fronts to travel NW to SE across the UK. A weak trailing frontal system consisting of a warm front closely followed by a cold front moved south-eastwards across the country during the morning, and this was quickly followed by another cold front/occluded front which was forecasted to be situated over the SE of the country by midday.

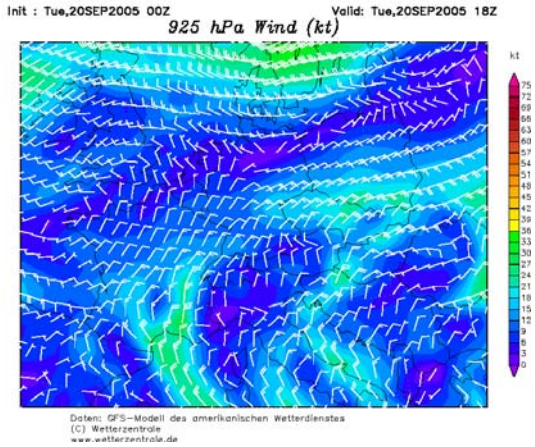




Met Office mesoscale model output (00:00z model run)

Whilst expected to be weakening and producing little in the way of precipitation, these fronts were expected to bring low cloud to the East Anglia, Thames estuary and Kent region during the midday to mid afternoon period. However, winds were forecasted to be very light, around 5 knots or less, and consequently predicted wind direction (from different models) varied from being westerly to south-westerly or southerly as the isobars separated and organised flow diminished.





Flight Summary

Following takeoff at 10:27:21z a NOxy calibration was carried out during transit at FL100 to point 40 off the NE coast of East Anglia. After descending to 8000ft, a profile descent P1 to 250ft asl was carried out following a right hand turn onto a heading of 182°. During P1, cloud top (CT) was seen at around 3500ft and cloud base (CB) around 3000ft, although both CT and CB were very variable in the region. Some broken clouds were seen below with tops at around 2300ft, and at around this level PCASP reported a huge spike in concentration. Once in the BL, CO, NOx and CN increased substantially, at low level towards the end of P1. The valve on the filters was opened at the end of P1. SO2 levels also increased at the start of Run 1, a run carried out at 500ft parallel to the Norfolk coast tracking south from point 40 towards point 41. AMS reported seeing observable loadings on the normal logging screen. SO2, NOx and CN levels started to fall away after 2-3 minutes of R1 (having peaked at around 5ppb, 20ppb and 20,000 cm-3 respectively), although CO remained elevated. Winds were light at around 5m/s, and 255°. R1 was continued on beyond point 41 until reaching the point of intersection with the extrapolated line B-A (in the outer Thames estuary) at 11:15:05.

The plume of NOx, SO2 and CN increased again at the end of R1 and start of R2, another run at 500ft back towards A. In the estuary, winds were again around 5m/s but on a heading of 240-250°. Concentrations of gases and particles decreased after the start of R2. The run was continued on beyond point A to get closer in to the coast. At this point cloud was seen above, and so it was decided to turn and ascend to 1500ft to head back to A and then do a first cross-wind run below cloud (mostly over land) back from point A to point B. On this run, R3, the wind was very light (4m/s or less) and it generally had a more northerly component (between 260-290°). The plume in NOx and CN was again observed along with a rise in CO, but peak loadings were

reduced to around 8ppb and 6000-7000 cm-3 respectively. Only a small rise in SO2 (to 0.5ppb) above background was detected. Ozone and NOx appeared to be anti-correlated. Towards the end of this transect cloud was encountered and so R3 was terminated and the transect completed as R4 at 1000ft. After turning, it was decided to do the reciprocal transect B-A (R5) in cloud at 1500ft. At 11:41z, the AMS was switched onto the CVI inlet, and the filters valve was closed. At the start of R5 cloud was quite thin and patchy, and cloud droplets were small as they were seen by the FSSP probe, but not by the 2D probes (the CPI was operating without a rack operator). At 11:48 rain was visible on the aircraft windscreen and by the 2D probes. Within a minute R5 was into a CB region and then into cloud free air. A sharp rise in NOx from 1 to 20ppb was observed, along with a slight rise in SO2 and a 50% rise in CN. The PCASP concentration was described as “rocketing up”. At this point it was realised the CVI had not been turned on, so the AMS was returned to the Rosemount inlet (11:53z). The CVI was prepared for the next in-cloud pass.

Run 6 was carried out on a reciprocal transect A-B at 3000ft, above the tops of cloud.where NOx, SO2 and CN concentrations were at detection limits for gases and less than 1000cm-3 for particles. O3was at its highest (>40ppb) since the transit leg. 8.5 minutes into R6, the aircraft encountered general CT and the tops of some small turrets, which coincided with a huge spike in CPC (inlet related?) and a small spike in NOx. CO was also observed to be varying in the convective CT regions during descent at the end of R6. The CVI was reported as working and so it was decided to do the reciprocal run B-A in cloud. The AMS was changed to the CVI inlet (at 12:14:25z) and R7 commenced at 2000ft. NOx started creeping up a little (filters were off) and after 3-4 minutes the aircraft flew in and out of cloud. At this level the wind was around 5 m/s and 250-260°. After 12:21 R7 was out of cloud, and the filters inlet was opened. NOx spiked to 5ppb, O3 increased as CO decreased, and CN increased to as high as 8000-9000 cm-3. A haze layer was seen below the aircraft, and above some cloud was observed.

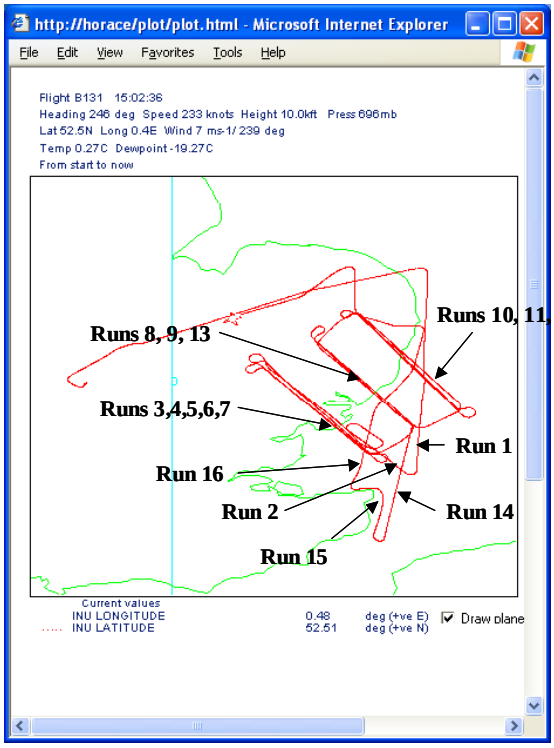
The aircraft ascended to transit at 2400ft to point C to start the middle set of cross-wind transects. With the AMS still on the CVI, the AMS CPC was seeing counts while the CVI CNC saw no counts. R8 going from C-D at 2400ft started out of cloud and then encountered cloud after 4 minutes. The cloud was broken, and again the CPC saw spikes as cloud edges were encountered. At 12:42:10z the FSSP was reported as having crashed but was rebooted by 12:42:54z, the end of R8. During R8 winds were light (~3m/s) and generally westerly with a slight northerly component (~270-280°). The reciprocal leg D-C, R9, was carried out below cloud at 1500ft and encountered a broad plume with a moderate level of pollution throughout (NOx ≤5ppb, CN ~5000cm-3 (֍2500) although CPC=3000֍1000cm-3, and CO again elevated >1500ppb). A larger spike in NOx was observed near the end of R9, but SO2 remained low (<0.5ppb) throughout R9. The AMS was switched back to the Rosemount inlet at the start of the run (at 12:46z) (and the filter valve opened). Ozone was again anti-correlated with NOx. During R9 winds were slightly stronger (4-6m/s) with a larger northerly component (~280-300°). The plume edge was encountered at the very end of R9 (NOx, CN and CO dropped, O3 increased)

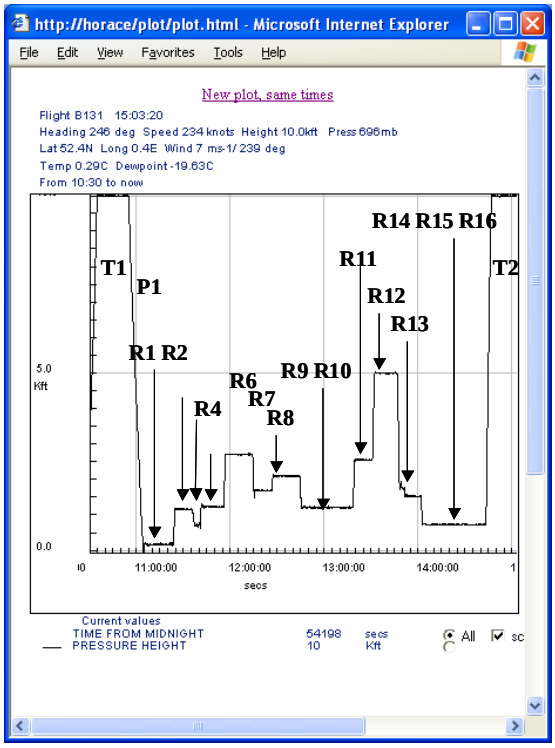
The aircraft transited at 1500ft from C to E to begin the final set of crosswind transects. R10 going from E-F at 1500ft below cloud encountered a similar broad plume to that seen in R9 (elevated NOx, CN, and slightly elevated CO, reduced O3)

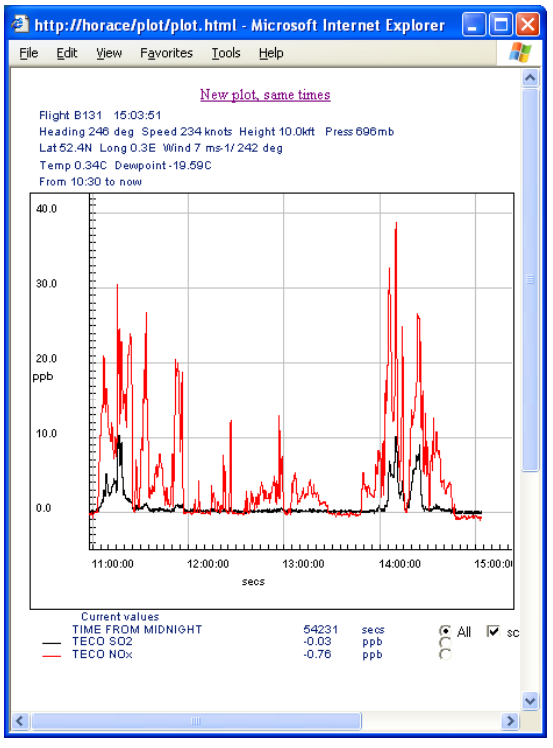
although peak concentrations were slightly lower in comparison. Between 13:05:30z and 13:07:45z the aircraft flew through a layer of haze. PCASP concentrations increased from around 600 to ~2000cm-3, but this was not seen by the FSSP. The reciprocal transect (R11) was carried out at 2800ft in cloud. The AMS switched to sampling off the CVI inlet at 13:16z, with the CPC seeing ~600cm-3 (?).At this altitude the wind was around 5-6m/s and 300-330°, but smoke from stubble burning on the ground indicated that the surface wind seemed to be directly across our track. The cloud disappeared right at the end of R11, and the AMS was returned to the Rosemount inlet (13:30z) and the filter valve opened. Although O3 concentration gradually increased across R11, NOx and CN levels remained similar to those on the below cloud transect. The reciprocal above cloud leg E-F (R12) was carried out at 5000ft well above cloud and the BL. Unsurprisingly, CN and CO concentrations dropped right down to background values (1500-2500cm-3 and ~100ppb), while NOx and SO2 were at/near their detection limits (effectively 0ppb).

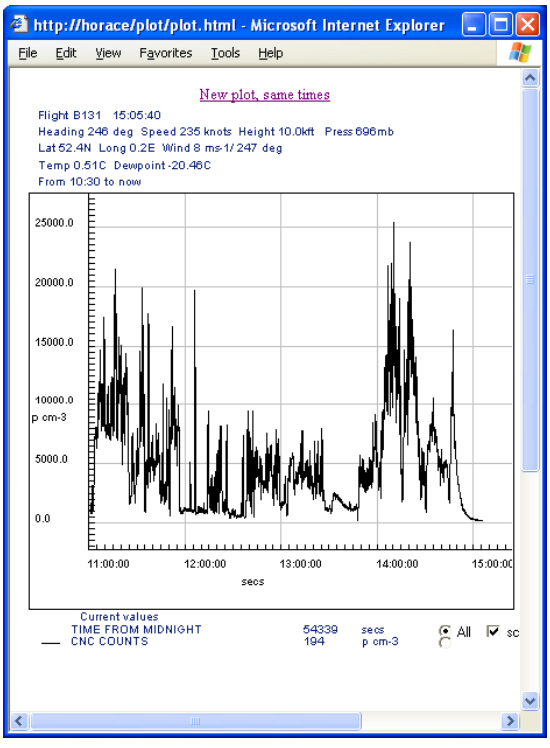
During descent (between F and E) CT and CB were seen to be around 2850 and 2150ft respectively (NB the filter inlet was not closed and AMS not switched to CVI inlet during descent). As soon as the BL was encountered CO, NOx, CN and PCASP concentrations increased. A final crosswind below cloud leg (R13) at 1800ft was carried out going from D to C. Plume concentrations were similar to those in R9. PCASP reported the lowest concentrations for some time. However, at the end of R13 the aircraft turned right and descended to 1000ft to carry out a cross estuary leg heading for point 42.During this manoeuvre, a thick haze layer was encountered and PCASP concentrations rocketed. A huge spike in SO2, NOx, CN (and decrease in O3) was observed 5.5 minutes into R14 (~14:08:32z) (7ppb, 33ppb, 22000cm-3 and 27ppb respectively) and the captain reported a region of good visibility. Winds at this level were ~4m/s and 250°. R14was stopped at point 42, and the aircraft made a right turn to return initially on a reciprocal to R14 – but closer in to the Kent coast, turning left at the north-eastern tip of the county to travel further into the estuary before turning right to carry out a run (R16) parallel to the track of R14. During the early part of R15 (between point 42 and the turn to start R16) off the east coast of Kent, the AMS recorded loadings of the order of μg. Levels of NOx, SO2 and CN shot up as a power station and another industrial building was passed on the coast on the LHS. During the last cross estuary transect (R16) the winds were light 2-3m/s and almost from due west (~275°). The huge plume was again picked up mid-run. Upon reaching the intersection with the track of the initial middle set of cross wind transects (C-D), R16 was continued on as the aircraft flew around the S and E coast of East Anglia at 1000ft. The original plume (smaller than the estuary plume) was encountered again in this leg. Upon reaching Lowestoft, R16 was terminated and the aircraft turned left and ascended to FL100 for the transit home and NOxy calibration .

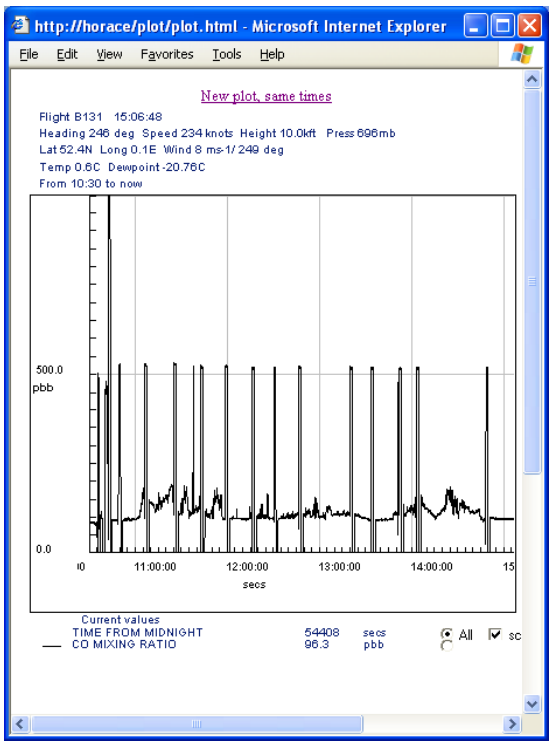
A further run by run pictoral summary of the flight may be obtained from the mission scientists powerpoint file of screen dumps from flight B131.

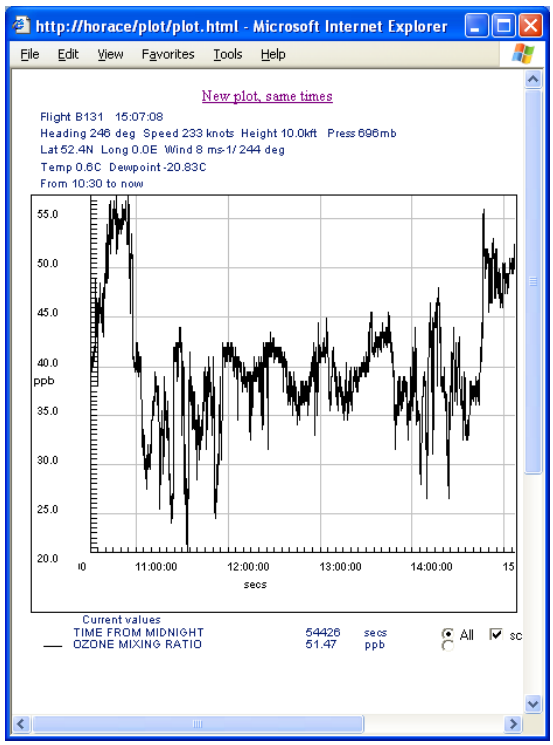

http://horace/plot/plot.html - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Flight B131 15:02:36
Heading 246 deg Speed 233 knots Height 10.0kft Press 696mb
Lat 52.5N Long 0.4E Wind 7 ms-1/ 239 deg
Temp 0.27C Dewpoint -19.27C
From start to now
Runs 8, 9, 13
Runs 10, 11
Runs 3,4,5,6,7
Run 1
Run 16
Run 2
Run 14
Run 15
Current values
INU LONGITUDE 0.48 deg (+ve E)
INU LATITUDE 52.51 deg (+ve N)
Draw plane

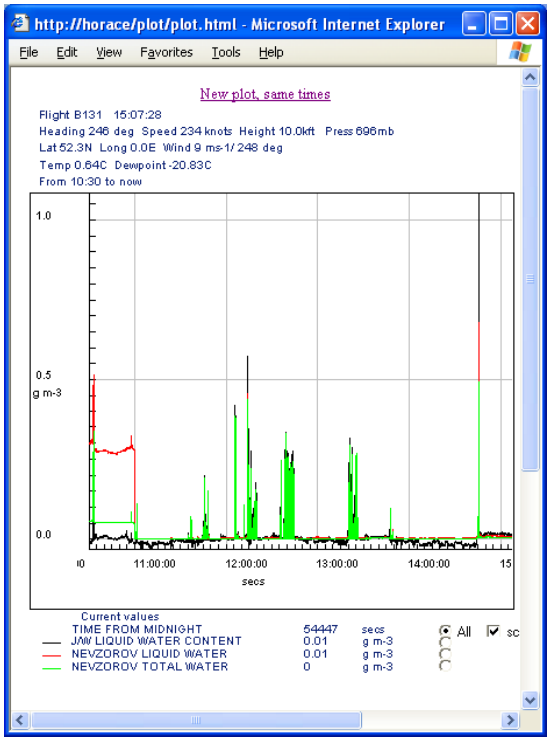

http://horace/plot/plot.html - Microsoft Internet Explorer
File Edit View Favorites Tools Help
New plot, same times
Flight B131 15:03:20
Heading 246 deg Speed 234 knots Height 10.0kft Press 696mb
Lat 52.4N Long 0.4E Wind 7 ms-1/ 239 deg
Temp 0.29C Dewpoint -19.63C
From 10:30 to now
T1
P1
R1 R2
R4
R6
R7
R8
R9 R10
R11
R12
R13
R14 R15 R16
T2
5.0
Kft
0.0
11:00:00
12:00:00
13:00:00
14:00:00
secs
Current values
TIME FROM MIDNIGHT 54198 secs
PRESSURE HEIGHT 10 Kft
All

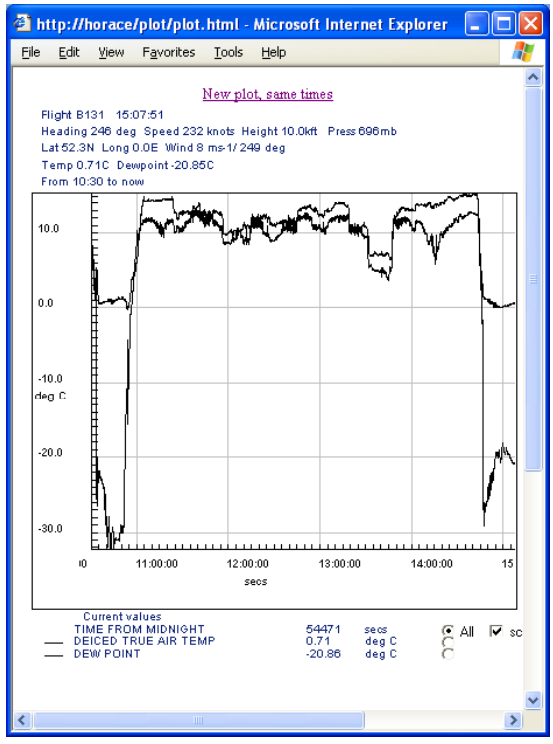

http://horace/plot/plot.html - Microsoft Internet Explorer
File Edit View Favorites Tools Help
New plot, same times
Flight B131 15:03:51
Heading 246 deg Speed 234 knots Height 10.0kft Press 696mb
Lat 52.4N Long 0.3E Wind 7 ms-1/ 242 deg
Temp 0.34C Dewpoint -19.59C
From 10:30 to now
40.0
30.0
20.0
ppb
10.0
0.0
11:00:00
12:00:00
13:00:00
14:00:00
secs
Current values
TIME FROM MIDNIGHT 54231 secs
TECO SO2 -0.03 ppb
TECO NOx -0.76 ppb
All


http://horace/plot/plot.html - Microsoft Internet Explorer
File Edit View Favorites Tools Help
New plot, same times
Flight B131 15:05:40
Heading 246 deg Speed 235 knots Height 10.0kft Press 696mb
Lat 52.4N Long 0.2E Wind 8 ms-1/ 247 deg
Temp 0.51C Dewpoint -20.46C
From 10:30 to now
25000.0
20000.0
15000.0
10000.0
p cm-3
5000.0
0.0
11:00:00
12:00:00
13:00:00
14:00:00
secs
Current values
TIME FROM MIDNIGHT 54339 secs
CNC COUNTS 194 p cm-3
All


http://horace/plot/plot.html - Microsoft Internet Explorer
File Edit View Favorites Tools Help
New plot, same times
Flight B131 15:06:48
Heading 246 deg Speed 234 knots Height 10.0kft Press 696mb
Lat 52.4N Long 0.1E Wind 8 ms-1/ 249 deg
Temp 0.6C Dewpoint -20.76C
From 10:30 to now
500.0
ppb
0.0
11:00:00
12:00:00
13:00:00
14:00:00
secs
Current values
TIME FROM MIDNIGHT 54408 secs
CO MIXING RATIO 96.3 ppb
All


http://horace/plot/plot.html - Microsoft Internet Explorer
File Edit View Favorites Tools Help
New plot, same times
Flight B131 15:07:08
Heading 246 deg Speed 233 knots Height 10.0kft Press 696mb
Lat 52.4N Long 0.0E Wind 8 ms-1/ 244 deg
Temp 0.6C Dewpoint -20.83C
From 10:30 to now
55.0
50.0
45.0
40.0
ppb
35.0
30.0
25.0
20.0
11:00:00
12:00:00
13:00:00
14:00:00
secs
Current values
TIME FROM MIDNIGHT 54426 secs
OZONE MIXING RATIO 51.47 ppb
All


http://horace/plot/plot.html - Microsoft Internet Explorer
File Edit View Favorites Tools Help
New plot, same times
Flight B131 15:07:28
Heading 246 deg Speed 234 knots Height 10.0kft Press 696mb
Lat 52.3N Long 0.0E Wind 9 ms-1/ 248 deg
Temp 0.64C Dewpoint -20.83C
From 10:30 to now
1.0
0.5
g m-3
0.0
11:00:00
12:00:00
13:00:00
14:00:00
secs
Current values
TIME FROM MIDNIGHT 54447 secs
J/W LIQUID WATER CONTENT 0.01 g m-3
NEVZOROV LIQUID WATER 0.01 g m-3
NEVZOROV TOTAL WATER 0 g m-3
All


http://horace/plot/plot.html - Microsoft Internet Explorer
File Edit View Favorites Tools Help
New plot, same times
Flight B131 15:07:51
Heading 246 deg Speed 232 knots Height 10.0kft Press 696mb
Lat 52.3N Long 0.0E Wind 8 ms-1/ 249 deg
Temp 0.71C Dewpoint -20.85C
From 10:30 to now
10.0
0.0
-10.0
deg C
-20.0
-30.0
11:00:00
12:00:00
13:00:00
14:00:00
secs
Current values
TIME FROM MIDNIGHT 54471 secs
DEICED TRUE AIR TEMP 0.71 deg C
DEW POINT -20.86 deg C
All

Mission Scientist's Log

MSci KEITH BOWER CLOPATS

Flight No **B**.131..... Date 20/09/05..... Page 1 of 7

GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
11:27:21	BST				T/O
11:30:20		4000'			some tiny patches of cloud below ~ 3000'
		5000'			above adjacent CB (~ 4700)
		6000'			in broken cloud
		7100'			CT (Captain → CT FL65-70)
11:36:00	NO_{xy}	FL100			NO_{xy} Cal.
10:49:50	NO_{xy}	FL100	72	52.7N/1.3E	1.31°/-2.97°C 4m/s/281° 696mb 249kts
10:51:59		FL100	72	52.7/1.6E	Over Coast of East Anglia
10:53:00	NO_{xy}	FL100	72	52.6/1.7E	NO_{xy} Cal complete 0.34°/-12.28° 9m/s/216°
10 54:50	descending				Will profile from above CT.
10:56:25	P1 st	FL60	162	52.6/1.8E	
10:57:19	P1	FL70	163	52.5/1.8E	4.12°/1.56°C 2m/s/255° 761mb 23kts
10:58:00	P1	6200			Some Cloud here.
11:00:59	P1	3500			CT 3500
11:01:20		3000			CB
11:01:36	P1	2600	164	52.2/1.7E	CT
	P1	2300			above CT now.
					cloud is quite thin with holes below/a
11:02:58					huge spike in PCASP
11:03:28					W 11kts
					CO ↑ NO_x Core Chem
					ONC 39000
11:03		500'			NO_x spike
11:04:32	P1 end	250'			Filter - zero value
11:05:57	RI st	500'	167	52.0/1.7E	

Mission Scientist's Log

MSCI KEITH BOWEN CLOPAP 8

Flight No B.131..... Date 20/09/05..... Page 2 of 7

GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
					AMS seeing lookings on Lagoon ocean
11:09:00	R1	500'	167	51.8/1.7E	CO cal complete
11:11:09					NO_x SO_2 falling a little now, CN too
11:11:54					CO higher 134 ppb
					NO_{2y} - some plume - fading off
					CO rising again - all other core down
11:15:05	R1 end	500'			CO & NO_x dropped - now rising
11:17:34	R2 st	500	315	51.5/1.5E	Wind 5m/s/225° 1007 mb 218 kts 14.64/10.7°C
11:20:27	R2	500	312	51.6/1.3E	passing A 5m/s/245 CO was dropping
					picking up again, NO_x doing same
11:22:33	R2 end	500	315	51.7/1.2E	Cloud ahead also
					CO at highest ~ 200 ppb - falling now
					to 185 - Alt - climbing to 1500'
11:24:46		1500			Going to point A to do 1st below cloud
					run over land.
11:28:43	R3 st	1500	311	51.6/1.3E	Heading towards coast
11:29:30					
					CO - step rise NO_x is stepping - CO
11:31:00	R3	1500			down. SO_2 0.47, NO_x 8.33 ppb CN 6000
					OPC - 3500/cm³ CNC 12 000
11:32.23	R3	1500	318	51.8/1.1E	PCASP, CO dropping reach 180 ppb
					NO_x level 19 ppb
11:33:24					CO, NO_x ↑ ↑
				51.9/0.9	
					CO↑ NO_x ↑

Mission Scientist's Log

M SCI KEITH BOWER C-CORE

Flight No B 131 Date 20/09/05 Page 3 of 7

GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
11:35:30	R3 end	1500	316	52.0/0.8E	OB flying
11:37:08	R4 st	1000'	323	52.1/0.7E	2D- rain (10min b run) 137mb
			323		1m/s/269° 986 mb, NO_y ↑
					CO ↑
11:40:15	R4 end	1000'		52.2/0.6	AMS → CVI - filters shut
		1500'			
11:43:26	R5 st	1500	160	52.2/0.6E	969mb 12.87°/11.33 undul 4ms/305
11:44:30	R5	1500	140	52.1/0.7	another start d Run - thin cloud - part B
11:45:31	R5	1500			Broken cloud -
					below safety altitude !!!
11:46:16	R5	1508	142	52.0/0.8E	in CT - now back in clr again
					2D- small particles - not seen on 2D probe
11:47:45					just FSSP- now 2D seeing it
11:48:15	R5	1500	141	51.9/0.9E	Rain on Windscreen - 2D too
11:49:18	R5	1500	142	51.9/0.9E	in CB here
11:50:sh					CO, NO_y ↑ and ↓ cloud.
					PCASP rocket up - CO↑
					AMS - some stuff on CVI -
ARGH!!!					NO CVI - BUGGER - AMS → Rosem
11:55:42	R5 end	1500	141	51.6/1.4E	
11:59:47	R6 st	3000'			
12:00:57	R6	3000	320	51.6/1.3E	10.23°/8.64° (240/7kt Watch Room)
12:01:50	R6	3000	320	51.7/1.2E	2m/s/28°, Core Chem coll dem 918mb.
12:03:32					Core Chem all gone - O_3 40ppb CO 100mb
					all gases v. dem

Mission Scientist's Log

M SCI KEITH BOWER CLOPPS

Flight No **B** 131 Date 20/9/08 Page 4 of 7

GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
1 16:19	R6	3000	320	51.9/0.9E	In cloud base - and out - CO via
					AMS - big spike CPC
12:09:30					CVI now working
12:11:11	R6 on	3000		52.1/0.6	
12:12:20					Photo LHS, RHS, of CT
					Will do next run in cloud - AMS on CVI
12:13:54				51.1/0.5	Cu tunnel.
12:14:25					on CVI inlet
12:16:45	2500				CO varying in in convective cloud
12:15:52	R7 st	2000'	139	52.1/0.7E	AMS - 10s/cm³ 50 or so
		2000	140	52.0/0.7E	11.91/10.75°C 3m/s/267° 952mb 216kts
12:18:40	R7	2000	140	51.9/0.9	NOx creeping up again (CO in cal mode)
					(Filters on dr.) In and out of cloud
12:21 ish	R7	2000	142	51.8/1.0	now out of cloud
					NOy - spike ~ 5 pcb. O3 ↑ as CO↓
					CN ↑ - out of cloud - open filter
12:24:ish					AMS CPC - ~ 10-11 cm⁻³
					Photo RHS - haze below Cloud above
12:25:50					Peak of CO after 5s - spike in PCASP
					NOx ↑ CO spike, 2D
12:26:22	R7end	2000		51.6/1.3E	CO background now.
12:29:50	trans	2400'	42	51.7/1.6E	level - core down calls
					CVI CPC - no cond, AMS CPC - Seeing cond
12: 31:30	R8 st	2400'	323°	51.8/1.6E	
					Circ over Felixstowe estuary - in dark

Mission Scientist's Log

M SCI ICETM BOWER CLOPAPS

Flight No **B**.131..... Date ....20/09/05..... Page 5 of 7

GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
12:35:40	R8	2400	321	52.0/1.4E	In cloud — grays in dam
					Deben — mist — in and out over Woodbridge
12:39:05	R8	2400	321	52.1/1.2	AMS — Sparks in CPC — wet & cloud
12:42:10	R8	2400	321	52.3/1.0E	FSSP frozen — will reboot
12:42:54	R8 end	2400		52.3/1.0	FSSP rebooted
12:46:43	R9	1500	142	52.3/1.0	Below cloud — rain
					Moderate pollution NO_x 3.9ppb
					CN 4500 cm^{-3} SO_2 0.37
					Downwind of Felixstowe/Harwich
12:57.12					NO_x starting up 91, SO 0.27 — Sparks NO_x
					CN ~ 4000-6000 cm^{-3} CPC ~ 2-4000
12:58:21	R9 end	1500	5	51.7/1.7E	12.52°/10.6° 969mb 7m/s/300° 204kts
13:03:14	R10	1500	321	51.9/2.0E	12.95/10.42° 969mb 2m/s/307° 200kts
					CO on way back up — NO_x too — just
					CN increasing too — CO ~~~
13:05:30	R10			52.0/1.8	PCASP — gone up last min 600→2000
					— in haze — FSSP not seen much
				52.1/	NO_x ↑, CN ↑ CO ~ 125ppb
13:07:45	R10	1500			Clear of haze — PCASP in near pure haze layer
13:08:45	R10			52.1/1.7E	CO NO_x ↓, wind 2m/s/277,
					Cast 267, Co 274
13:10:21	R10	1500	322	52.2/1.6E	Crossing Coast
					CO rising slowly — NO_x — going up, CN ↑
13:15:36	R10 end	1500		52.5/1.2E	
13 19:47	R11	2800	146	52.4/1.3E	10.51/10.69° 922mb 213kts 3m/s/326°

Mission Scientist's Log

MSci KEITH BOWER CLOUDS8

Flight No **B**.131..... Date 20/01/05..... Page 6 of 7

GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
13:21.14	R11	2800	146	52.4/~~1.5~~1.4E	AMS - CVI inlet - 600 cm^{-3}
					only stacked strato cu patches at this level
					sfc wind is across rw on ground - stability
					burning
13:21:40	R11	2800	142	51.9/1.9E	AMS → Rosemount, Filters on again
13 30:47	R11 end	2800	142	51.9/2.0E	
13 37:38			↺		3 pilots - One RHS - looking back at CT's
13:54:17	R12 st	5000	331	51.9/2.0E	
13 48:20					CT ~ 2850 CB ~ 2150
(13:46:36)					CO↑ NO$_2$↑ PCASP↑
R12 end					
13:50:06	~~R12 st~~	~~5000~~			
13:5 .9	R13 st	1800	145	52.2/1.1E	Filters on, AMS still on Rosemount, CCN sampling
					2D - PCASP lowest Ae for long time
14:02:00	R13 end	1600	↷	51.7/1.7E	2D - PCASP - reached up - deep in haze layer
14:03:03	R14 st	1000	191	51.7/1.6E	
14:09:32	R14	1000	190	51.3/1.5E	huge spike in SO$_2$, NO$_2$, CN
					O$_3$ now ↑
14:12.30	R14	1000	190	51.2/1.5E	O$_3$ dropping again - as are all others
					Good Visibility here
14:14:05	R14				Sharp rise in NO$_2$ O$_3$ drawn South
14.15:08	R14e	1000		51.0/1.5E	R17
14:16:51	R15s	1000			CCN sample
					AMS- order of mg - again all v same
14:18:28		1000		51.2/1.4E	NO$_2$↑ SO$_2$↑ CN↑
					power str. of to LHS ?? + other instruments

Mission Scientist's Log

MSci KEITH BOWER CLOPAP8

Flight No **B**131 Date 20/09/05

GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
					CO had dipped down – now recovering back up
					as is NO_x, SO_2
14:23.31	R15 end	1000		51.3/1.2E	
14 24:23	R16 st	1000	19	51.4/1.2E	– Not much cloud above
					CO dropped - now ↑ again
14:27:50					CO flushing up again – NO_x ↑
14:28:59	R16	1000	9	51.6/1.3E	14.6/11.58° 3m/s/272° 986mb 207kts
14:31:02	R16			51.7/1.4	CO – at background NO_x etc follow
					CO, NO_x ↑ again
					good vis to West, poor vis to N.
14:33:48	R16				1m/s/255
14:34:03	R16B	1000.	38.		turn.
14:35.13	R16B				Sharp increase in CO. CN ↑ NO_x too
					small rise in SO_2
14.40	R16B	1000	11	52.3/1.7E	Thick cloud above 986mb, 0m/s/181°
					15.07/1.7E
14:42 57	R16c	1000	5	52.4/1.7E	0m/s/247 14.7/12.5° 97
					LHT and ascending
14:46:32	NO_{xy}	FL100			NO_{xy} Calc
15:04:12	NO_{xy}	FL100	246	52.4/02E	NO_{xy} Calc complete 0.44°/-20.26°
					8m/s/247° 698mb 235kts
16:19:39	BST				Landing

CORE CHEMISTRY FLIGHT LOG FOR FLIGHT FOLDER

Flight Number : B131
Date : 20 Sept 2005
Operator & contact info : Doug Anderson (dougan@faam.ac.uk)

Problems with Instruments

CO	None
O_3	None
NO_x	None
SO_2	None
TDLAS	Not fitted
WAS	None notified

CO Calibrations

A full calibration lasts approx three minutes, it consists of a cal and a zero
Shorter (quick cals) are sometimes done at low level which is calibration only

Time (GMT)	Level	Comments
10:35:30 – 10:37	FL100	Bad cal – cal gas pressure low
10:40:22	FL100	Redone with full cal gas pressure – sensitivity low
10:45:02	FL100	Sensitivity still a little low
10:51:51	FL100	
11:08:54	500’	
11:27:51	1500’	
11:37:30 – 11:38:00	700’	Quick cal valve check – no full cal. required.
11:45:11	1500’	
12:01:28	3000’	
12:19:01	2000’	
12:33:00	2400’	
12:49:20	1500’	
13:22:55	2800’	
13:36:25	FL050	
13:51:30 – 13:51:45	200’	Aborted due to change of altitude
13:54:54	1800’	
14:06:10	1000’	
14:51:18	FL100	

CLOUD PHYSICS LOG

Flight No. B131 **Date: 20/08/05** **Operator:JT** **Page1 of 4**

G.M.T.	PCASP		FSSP	SID1	2D2-C			2D2-P			Remarks
DRS Time	Conc/cc	Mean R	Block Transfer	Particle Count	Conc/L	Max Size	Habit	Conc/m3	Max Size	Habit	
				Not requested							SID not requested
											DAU 1 15 seconds slow
10:56:24	258	0.06	17		0	0	0	0	0	0	Profile 1 descent 8000ft
10:57:57	189	0.06	17		0	0	0	0	0	0	7000ft
10:58:13	39	0.07	19		0	0	0	0	0	0	6000ft
10:59:10	41	0.07	19		0	0	0	0	0	0	5000ft
11:0010	050	0.06	19		0	0	0	0	0	0	4000ft
11:01:10	58	0.08	21		0	0	0	0	0	0	3000ft / 35000ft cloud top
11:02:04	302	0.08	37		0	0	0	0	0	0	2000ft
11:03:01	1054	0.08	37		0	0	0	0	0	0	1000ft
11:03:31	1509	0.08	37		0	0	0	0	0	0	500ft
11:04:00	1547	0.08	37		0	0	0	0	0	0	250ft – end of profile 1
11:05:55	1279	0.09	37		0	0	0	0	0	0	Start run 1 500ft
11:07:00	1243	0.08	37		0	0	0	0	0	0	
11:09:00	1576	0.08	37		0	0	0	0	0	0	
11:11:00	1067	0.08	37		0	0	0	0	0	0	
11:13:00	884	0.08	37		0	0	0	0	0	0	
11:15:00	1255	0.07	37		0	0	0	0	0	0	End of run 1
11:17:35	836	0.08	37		0	0	0	0	0	0	Start run 2 500ft
11:19:00	1371	0.08	37		0	0	0	0	0	0	
11:21:00	1180	0.08	37		0	0	0	0	0	0	
11:22:34	1416	0.09	37		0	0	0	0	0	0	End of run 2
11:28:44	507	0.07	37		0	0	0	0	0	0	Start run 3 1500ft
11:30:00	1156	0.08	37		0	0	0	0	0	0	
11:32:00	1570	0.08	38		0	0	0	0	0	0	End of large spike approx 2000
11:34:00	962	0.07	38		0	0	0	0	0	0	
11:35:40	947	0.08	43		0	0	0	0	00	0	End run 3 to drop out of cloud
11:37:08	907	0.08	47		0	0	0	2008	400	1	Start run 4 1000ft
11:39:00	854	0.08	47		0	0	0	0	0	0	
11:40:15	855	0.08	47		0	0	0	0	0	0	End of run 4
11:43:26	943	0.09	53		0-	0	0	0	0	0	Start of run 5 1500ft
11:45:00	382	0.06	84		0	0	0	0	0	0	Broken cloud leg

CLOUD PHYSICS LOG

Flight No. B130 **Date: 20/09/05** **Operator: JT**

G.M.T.	PCASP		FSSP	SID1	2D2-C			2D2-P			Remarks
DRS Time	Conc/cc	Mean R	Block Transfer	Particle Count	Conc/L	Max Size	Habit	Conc/m3	Max Size	Habit	
11:47:00	284	0.07	224		0	0	0	0	0	0	
11:49:00	963	0.07	240		0	0	0	0	0	0	Passed through rain
11:51:00	2095	0.07	241		0	0	0	0	0	0	
11:53:00	1593	0.08	241		0	0	0	0	0	0	
11:55:41	1675	0.08	241		0	0	0	0	0	0	End of run 5
11:58:48	259	0.06	241		0	0	0	0	0	0	Start run 6 3000ft
12:00:00	71	0.06	241		0	0	0	0	0	0	
12:02:00	73	0.06	241		0	0	0	0	0	0	
12:04:00	36	0.06	241		0	0	0	0	0	0	
12:06:00	438	0.2	402		0	0	0	0	0	0	Went through cloud little rain
12:08:00	71	0.07	419		0	0	0	0	0	0	
12:10:00	101	0.06	419		0	0	0	0	0	0	
12:11:13	101	0.06	419		0	0	0	0	0	0	End of run 6
12:15:55	351	0.09	744		0	0	0	0	0	0	Start of run 7 2000ft
12:17:00	467	0.07	800		0	0	0	0	0	0	
12:19:00	158	0.07	839		0	0	0	0	0	0	
12:21:00	774	0.08	944		0	0	0	0	0	0	
12:23:00	213	0.06	944		0	0	0	0	0	0	
12:25:00	1431	0.09	944		0	0	0	0	0	0	
12:26:24	089	0.07	944		0	0	0	0	0	0	End of run 7
12:31:37	110	0.06	944		0	0	0	0	0	0	Start of run 8 2400ft
12:33:00	150	0.07	944		0	0	0	0	0	0	
12:35:00	272	0.07	944		0	0	0	0	0	0	
12:37:00	19	0.06	1022		0	0	0	0	0	0	
12:39:00	671	0.1	1022		0	0	0	0	0	0	
12:41:00	323	0.17	1022		0	0	0	0	0	0	FFSSP restarted after freeze
12:42:59	362	0.23	170		0	0	0	25	200	1	End of run 8
12:46:44	550	0.08	432		0	0	0	0	0	0	Start of run 9 1500ft
12:48:00	744	0.08	432		0	0	0	0	0	0	
12:50:00	565	0.08	443		0	0	0	0	0	0	
12:52:00	620	0.08	432		0	0	0	0	0	0	
12:54:00	348	0.07	432		0	0	0	0	0	0	

CLOUD PHYSICS LOG

Flight No. B130 **Date:20/09/05** **Operator: JT** **Page 3 of 4**

G.M.T.	PCASP		FSSP	SID1	2D2-C			2D2-P			Remarks
DRS Time	Conc/cc	Mean R	Block Transfer	Particle Count	Conc/L	Max Size	Habit	Conc/m3	Max Size	Habit	
12:56:00	543	0.07	432		0	0	0	0	0	0	
12:58:00	674	0.08	432		0	0	0	0	0	0	
13:58:19	734	0.08	432		0	0	0	0	0	0	End of run 9
13:03:17	620	0.07	432		0	0	0	0	0	0	Start of run 10 1500ft
13:05:00	1443	0.08	432		0	0	0	0	0	0	
13:07:00	1421	0.08	432		0	0	0	0	0	0	
13:09:00	1024	0.07	432		0	0	0	0	0	0	
13:11:00	1033	0.08	432		0	0	0	0	0	0	
13:13:00	646	0.08	432		0	0	0	0	0	0	
13:15:00	852	0.09	432		0	0	0	0	0	0	
13:15:36	1054	0.09	432		0	0	0	0	0	0	End of run 10
13:19:40	788	0.09	436		0	0	0	0	0	0	Start of run 11 2800ft
13:21:00	526	0.09	587		0	0	0	0	0	0	
13:23:00	456	0.12	754		0	0	0	0	0	0	
13:25:00	472	0.15	971		0	0	0	66	200	1	
13:27:00	40	0.06	990		0	0	0	0	0	0	
13:29:00	35	0.06	990		0	0	0	0	0	0	
13:30:48	40	0.06	990		0	0	0	0	0	0	End of run 11
13:34:20	36	0.06	990		0	0	0	0	0	0	Start run 12 5000ft
13:36:00	46	0.06	990		0	0	0	0	0	0	
13:38:00											
13:42:00	457	0.06	990		0	0	0	0	0	0	
13:44:00	25	0.06	990		0	0	0	0	0	0	
13:46:29	51	0.06	990		0	0	0	0	0	0	End of run 12
13:51:59	821	0.09	1027		0	0	0	0	0	0	Start run 13 1800ft
13:53:00	795	0.09	1027		0	0	0	0	0	0	
13:55:00	869	0.08	1027		0	0	0	0	0	0	
13:57:00	1226	0.08	1027		0	0	0	0	0	0	
13:59:00	974	0.08	1027		0	0	0	0	0	00	
14:01:00	1040	0.08	1027		0	0	0	0	0	0	
14:02:00	514	0.08	1027		0	0	0	0	0	0	End of run 13
14:03:04	1529	0.08	1027		0	0	0	0	0	0	Start run 14 1000ft

CLOUD PHYSICS LOG

Flight No. B131 **Date: 20/09/05** **Operator: JT** **Page 4 of 4**

G.M.T.	PCASP		FSSP	SID1	2D2-C			2D2-P			Remarks
DRS Time	Conc/cc	Mean R	Block Transfer	Particle Count	Conc/L	Max Size	Habit	Conc/m3	Max Size	Habit	
14:05:00	1401	0.08	1027		0	0	0	0	0	0	
14:07:00	1049	0.08	1027		0	0	0	0	0	0	
14:09:00	1008	0.08	1027		0	0	0	0	0	0	
14:11:00	960	0.08	1027		0	0	0	0	00	0	
14:13:00	976	0.08	1027		0	0	0	0	0	0	
14:15:07	657	0.08	1027		0	0	0	0	0	0	End of run 14
14:16:53	1020	0.08	1027		0	0	0	0	0	0	Start of run 15 1000ft
14:18:00	1070	0.08	1027		0	0	0	0	0	0	
14:20:00	980	0.08	1027		0	0	0	0	0	0	
14:22:00	891	0.08	1027		0	0	0	0	0	0	
14:23:31	1116	0.08	1027		0	0	0	0	0	0	End of run 15
14:24:27	825	0.08	1027		0	0	0	0	0	0	Start of run 16 1000ft
14:26:00	814	0.08	1027		0	0	0	0	0	0	
14:28:00	813	0.08	1027		0	0	0	0	0	0	
14:30:00	873	0.08	1027		0	0	0	0	0	0	
14:32:00	910	0.08	1027		0	0	0	0	0	0	
14:34:00	623	0.08	1027		0	0	0	0	0	0	
14:36:00	721	0.08	1027		0	0	0	0	0	0	
14:38:00	691	0.08	1027		0	0	0	0	0	0	
14:40:00	777	0.08	1027		0	0	0	0	0	0	
14:42:00	889	0.08	1027		0	0	0	0	0	0	
14:43:00	964	0.09	1027		0	0	0	0	0	0	End of run 16

FLIGHT NUMBER: B181	DATE: 20/09/05	OPERATOR: SWH	Page 2 of 2
PROJECT: CLOPAP			

CCN LOG

ALLEVIATOR GMT		HEIGHT	TEMP INLET			STATIC				REMARKS
ON	OFF			1	2	3	4	5		
142635	142708	1000ft		1.75	2.5	3.5	4.25	5.5		
			26.89	0.47	0.68	1.04	1.33	1.94	S	
			2650	1214	1279	1925	2343	3000	D	
			2644	268	268	268	274	279	B	
			26.54	2282	2268	2263	2253	2247	R	
			26.13	1022.3	1022.3	1022.4	1022.4	1022.4	P	
143921	143955	1000ft	26.29	0.47	0.68	1.02	1.32		S	
			2651	1123	1505	2188	2512		D	Change height
			26.60	300	304	313	303		B	
			2643	2240	2234	2226	2221		R	
				1022.3	1022.3	1022.4	1022.4		P	
				1.75	2.5	3.5	4.25	5.5		
									S	
									D	
									B	
									R	
									P	
									S	
									D	
									B	
									R	
									P	
				1.75	2.5	3.5	4.25	5.5		
									S	
									D	
									B	
									R	
									P	
									S	
									D	
									B	
									R	
									P	
				1.75	2.5	3.5	4.25	5.5		
									S	
									D	
									B	
									R	
									P	
									S	
									D	
									B	
									R	
									P	

FLIGHT NUMBER: B131	DATE: 20/09/05	OPERATOR: SWH	Page 1 of 2
PROJECT: CLOPAP.			

CCN LOG

ALLEVIATOR GMT		HEIGHT	TEMP INLET			STATIC				REMARKS
ON	OFF			1	2	3	4	5		RUN 2
111745	111818	500ft		1.75	2.5	3.5	4.25	5.5		
			25.20	0.47	2.68	1.09			S	Changed
			25.0	70	74	39			D	Height
			2509	161	148	118			B	
			2505	2212	2223	2248			R	
			2498	1023.7	1023.7	1023.7			P	
112834	112921	1500ft	25.80	0.47	0.69	1.04	1.34	1.99	S	RUN 2
			25.89	2043	2201	3637	3795	4092	D	
			2555	701	702	709	709	701	B	
			25	2219	2321	2325	2321	2324	R	
			8	1024.0	1024.1	1023.9	1023.8	1023.7	P	
				1.75	2.5	3.5	4.25	5.5		
124720	124755	1500ft	2690	0.46	0.67	1.07	1.31	1.95	S	
			2632	1464	1832	1926	2954	3925	D	
			2626	711	699	695	690	746	B	
			26.12	2323	2326	2321	2320	2316	R	
			2594	1022.8	1022.8	1023.0	1023.0	1023	P	
125530	125601	1500ft	26.34	0.47	0.69	1.03	1.35	1.94	S	
			26.21	1795	1951	2457	2715	3609	D	
			26.08	709	700	700	702	704	B	
			26.02	2323	2320	2317	2311	2305	R	
			2601	1023.0	1023.0	1023.0	1023.0	1023	P	
				1.75	2.5	3.5	4.25	5.5		
130545	130614	1500ft	26.15	0.47	0.67	1.02	1.34	1.95	S	
			2610	1324	2181	2571	3089	5046	D	
			26.08	739	735	731	736	735	B	
			2602	2309	2307	2302	2289	2288	R	
			25.98	1022.9	1023.0	1022.8	1022.8	1023	P	
135230	135320	1800	26.38	0.45	0.68	1.03	1.33	1.94	S	
			2631	495	659	1857	2449	2595	D	
			2630	390	381	383	391	392	B	
			2626	2330	2338	2331	2332	2332	R	
			2621	1022.3	1022.5	1022.4	1022.4	1022.4	P	
				1.75	2.5	3.5	4.25	5.5		
140309	140341	1000ft	26.34	0.43	0.66	1.01	1.32	1.92	S	
			2631	2039	2734	2919	2895	4010	D	
			2627	365	364	375	376	380	B	
			2626	2335	2332	2322	2321	2317	R	
			2614	1022.4	1022.4	1022.3	1022.2	1022.3	P	
141708	141741	1000ft	26.14	0.46	0.68	1.02	1.34	1.91	S	
14			2610	1793	2657	2891	3489	3707	D	
			2605	333	320	311	312	310	B	
			2601	2308	2301	2292	2285	2280	R	
			26.00	1022.9	1022.4	1022.4	1022.3	1022.4	P	

Bored

Filter Sampling Log

Flight No: B131 **Date:** 20/9/ 2005 **Operator:** AP

Type of filters mounted in	Top inlet	SUPPLIED / INSERTED BY KEITH BOWER	Bottom inlet	DUMMY FILTER

Run No	Disk No 1	Disk No 2	Disk No 3	Top/ Bottom	Time On	Time Off	Flight Run	Accum Vol [l]	Comments
	TOP	MIDDLE	BOTTOM						
Transit				Top	11.05z	11.35z		4210	
Transit				Bottom	11.05z	11.35z		5140	
Filters run1				Top	11.37z	11.42z		4888	
Filters run1				Bottom	11.37z	11.42z		5988	
2				Top	11.54z	11.56z		5228	
2				Bottom	11.54z	11.56z		6398	
3				Top	12.23z	13.16z		2449	+
3				Bottom	12.23z	13.16z		5156	+
4				Top	13.29z	13.48z		4740	+
4				Bottom	13.29z	13.48z		7943	+
5				Top	13.52z	14.44z		1848	++
5				Bottom	13.52z	14.44z		6666	++
									+ = COUNTER 9999 PLUS READING
									++ = COUNTER 9999 TWICE PLUS READING

WAS + PAN sampling summary

Flight number: B131

Date: 2019/05

Campaign Name: CLOPAP

Operator: DEBBIE O'SULLIVAN

time	Bottle #	comments	Final pressure (bar)
		Argon Cylinder = 150 bar	
		WAS Cylinder = 56 bar	
		Time Check at 10:08:30 Z	
		Cases 7, 5 and 1 available 31 bottles	
N10:54		Profile 1 started at FL 80	
11:05:56		Run 1 at 500 ft	
11:10:12	1	in plume	3.35
11:15:00		End of Run 1	
11:17:36		Start of Run 2 @ 500ft towards A	
11:20:26		just passing point A	
11:21:39	2	in plume	3.36
11:22:35		end of Run 2	
11:28:44		Start of Run 3 at 1500 ft from A	
11:30:37	3	over sea in plume	3.32
11:33:27	4	over land in plume	3.32
11:35:33		end of Run 3, descending	
11:37:10		Run 4 at 1000 ft	
11:40:		end of Run 4	
11:43:28		Start of Run 5 at 1500 ft - In cloud Run	
11:50:04	5	CO + NOx increasing	3.32
11:51:41	6	In plume	3.32
11:55:43		end of Run 5, ascending	

WAS + PAN sampling summary

Flight number: B131

Date: 20/9/05

Campaign Name: CLOPAP

Operator: DEBBIE

time	Bottle #	comments	Final pressure (bar)
11:58:47		Start of Run 6 at 3000 ft	
12:03:28	7	Clean background air above cloud	3.27
12:11:17		end of Run 6	
12:15:54		Run 7 at 2000 ft in cloud	
12:26:08	8		3.30
12:26:24		end of Run 7	
12:31:38		Start of Run 8 at 2400 ft → middle transect in cloud Run	
12:42:59		end of RUN 8	
12:46:44		Start of Run 9 at 1500 ft out of cloud	
12:50:10	9	In London Plume	3.31
12:53:30	10		3.31
12:58:26		end of Run 9	
13:03:20		Start of Run 10 at 1500 ft - last transect.	
13:04:26	11	CO↑ NOx↑ In Haze	3.31
13:12:07	12	" "	3.31
13:15:37		end of Run 10 at 1500 ft	
13:19:45		Start of Run 11 at 2800ft - in cloud Run Last transect.	
13:23:22	13		3.29
13:28:56	14		3.28
13:30:52		end of Run 10 at 2800ft	

WAS + PAN sampling summary

Flight number: B131

Date: 20/8/05

Campaign Name: CLOPAP

Operator: DEBBIE

time	Bottle #	comments	Final pressure (bar)
13:34:35		Run 12 FL 50	
13:37:46	15		3.19
13:46:36		end of Run 12	
13:52:02		Start of Run 13 at 1800 ft	
13:55:08	25	towards point C (from D) middle transect	3.30
14:02:04		end of Run 13 at 1800 ft	
14:03:04		start of Run 14 at 1000 ft	
14:06:57	26	Haze	3.32
14:13:24	27	↑ CO, NOx	3.32
14:15:08		end of Run 14 at 1000 ft	
14:16:56		Start of Run 15 at 1000 ft	
14:18:32	28	↑ CO, NOx	3.32
14:23:34	29	"	3.32
14:23:36		end of Run 15 at 1000 ft	
14:24:36		Start of Run 16 at 1000 ft	
14:28:29	30	↑↑ CO, NOx	3.32
14:31:50	31	estuary area.	3.32
14:42:59	~~32~~	end of 16 at 1000 ft	
14:47:08	32		3.04

used 23 bottles (8 bottles left - case 1)

WAS + PAN sampling summary

Flight number: .....

Date: .....

Campaign Name: .....

Operator: .....

time	Bottle #	comments	Final pressure (bar)
		Was end pressure = 55 bar Argon cylinder end pressure = 147 bar	

B131 JAMES 20/9/5

INLET SWITCHES

TIME	ROSEMOUNT	CVI
		✓ - CVI NOT RUNNING
11:41	~~✓~~	
11:53	✓	
12:15 (ish)		✓
12:46	✓	
13:16		✓
13:30	✓	

Flight Manager's Instrument Status Log

Flight No. **B** 131 Date: 20 September 2005

Instrument	Fitted	Operated	Instrument	Fitted	Operated
Navigation			**Cloud Physics**		
INU		**Y**	**Probes**		
XR5M GPS		**Y**	FFSSP		**Y**
Cruciform GPS		**N**	PCASP		**Y**
Satcom C		**Y**	2D-P		**n**
Satcom H		**Y**	2D-C		n
Thermometers			Cloudscope		**N**
De-Iced Temp		**Y**	SID 1		**N**
Non De-Iced		**Y**	SID 2		**N**
Heimann		**N**	HVPS		**N**
Hygrometers			CIP25		**N**
G. Eastern		**Y**	CIP100		**N**
J. Williams		**Y**			
Nevzorov		**Y**			
TWC		**n**			
FWVS		**N**	**Racks:**		
Radiometers			INC		**N**
Upper Clear		**Y**	CCN / CNC		**Y**
" Red		**Y**	CVI		**Y**
" Silicon		**Y**			
" JO1D		**Y**	**Aerosol**		
Lower Clear		**Y**	PSAP		**N**
" Red		**Y**	Nephelometer		**N**
" Silicon		**Y**	Filters		**Y**
" JO1D		**Y**	AMS		**Y**
Large Radiometers					
TAFTS		**N**			
MARSS		**N**			
DEIMOS		**N**	**Others:**		
ARIES		**N**	NIR TDLAS		N
SWS		N	2BT O3		N
Chemistry			VACC		N
Ozone		Y	PEROXIDE		Y
SO2		Y	Formaldehyde		Y
NOX		Y	ADA		Y
CO		Y	CPI		Y
ORAC		N	NOxy		Y
PAN		Y	PTRMS		n
PERCA		N	Bag Sampling		n
WAS		Y	Tube Sampling		N

Faults / Incidents Log

Flight No. B131
Date: 20 September 2005

Instruments

1 TWC not fitted
2 FM's pc froze – rebooted ok
3 T/O vibration stongly evident as striations on FFC, some still seen in climb and cruise –Avalon investigating in case of loose connection
4 ARINC 429 pressure displayed as 1013 & 0kft despite rebooting port aft dlu. Ok in flight

Aircraft

Nil

Satcom H Calls nil